

Single-phase transformer feeding a non-linear load

Consider a single phase transformer whose ratings are 2kVA, 230V/115V 50Hz. Open circuit test was conducted on the LV side of the transformer keeping the HV side open circuited and the results obtained are shown below

Voltage	Current	Power
115V	0.925A	42.2W

Short circuit test was conducted on the HV side with the LV side short circuited. Results obtained from the test is tabulated below

Voltage	Current	Power
9.1V	8.42A	70.6W

From the above results the parameters of the equivalent circuit of transformer can be calculated as:

Open Circuit test	
R_0	X_0
313.39 Ω	138.84 Ω

Short Circuit Test	
R_{eq}	X_{eq}
0.996 Ω	0.418 Ω

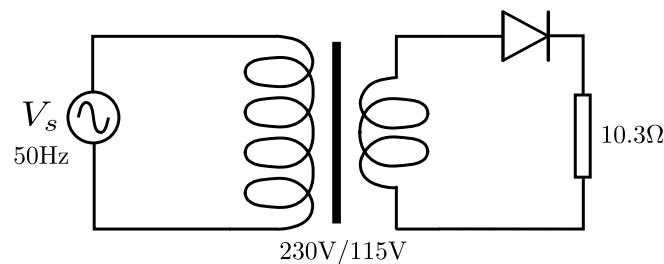


Figure 1: Circuit Diagram

The same transformer is now connected in a circuit as shown in Fig.1. The simulation program for the same shows the result as shown in Fig.2.

- Connect the circuit shown in Fig.1 and observe the waveforms in a oscilloscope. Is the resulting waveform same as that obtained from the simulations
- Observe the HV side current. Why is the waveform so obtained?

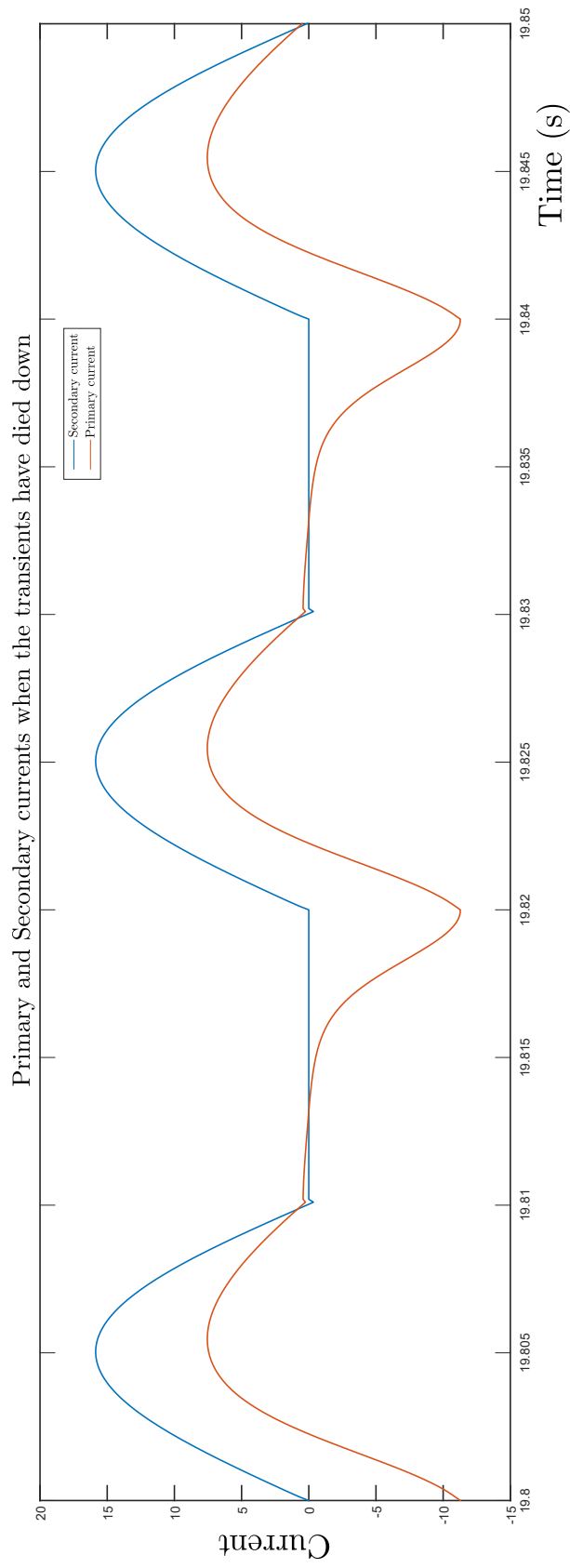


Figure 2: Simulation Result